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DOCKET NO. 2001.05.024.WS0
U.S. SERIAL NO. 10/078,277
PATENT

IN THE CLAIMS

The current claims follow. For claims not marked as amended in this response, any difference in the claims below and the previous state of the claims is unintentional and in the nature of a typographical error.

1. (Original) For use in a base station of a code division multiple access (CDMA) wireless network, wherein said base station communicates with a plurality of wireless access terminals using transmit beams formed by an adaptive antenna array, an apparatus for allocating orthogonal codes used for downlink transmissions to said plurality of wireless access terminals comprising:

a database capable of storing R active wireless terminal records, each of said R active wireless terminal records containing: 1) an active orthogonal code and 2) corresponding downlink beamforming coefficients used to communicate with one of said wireless access terminals; and

a controller associated with said database capable of receiving a notification that a new wireless access terminal is accessing said base station and, in response to said notification, comparing said each of said R active wireless terminal records to new downlink beamforming coefficients suitable for forming a downlink transmit beam for transmitting to said new wireless access terminal and, in response to said comparison, determines at least one active wireless terminal record containing corresponding downlink beamforming coefficients that have the least correlation with said new downlink beamforming coefficients.

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2. (Original) The apparatus as set forth in Claim 1 wherein said controller assigns an active orthogonal code in said at least one active wireless terminal record to be used in downlink transmissions to said new wireless access terminal.

3. (Original) The apparatus as set forth in Claim 2 wherein said base station uses up to K orthogonal codes for said downlink transmissions and said controller compares said each of said R active wireless terminal records to said new downlink beamforming coefficients in response to a determination that all of said K orthogonal codes are in use.

4. (Original) The apparatus as set forth in Claim 3 wherein said controller determines a first plurality of active wireless terminal records containing corresponding downlink beamforming coefficients that have the least correlation with said new downlink beamforming coefficients and further determines from said first plurality of active wireless terminal records a first active wireless terminal record containing an active orthogonal code used for downlink transmissions to a least number of said plurality of wireless access terminals.

5. (Original) The apparatus as set forth in Claim 4 wherein said controller assigns said active orthogonal code in said first active wireless terminal record to be used in downlink transmissions to said new wireless access terminal.

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6. (Original) The apparatus as set forth in Claim 2 wherein said base station is operable to communicate in S sectors of a cell site associated with said base station and said base station uses up to K orthogonal codes in each of said S sectors for said downlink transmissions and wherein said controller compares said each of said R active wireless terminal records to said new downlink beamforming coefficients in response to a determination that all of said K orthogonal codes are in use in a first sector in which said new wireless access terminal is accessing said base station.

7. (Original) The apparatus as set forth in Claim 6 wherein said controller determines a first plurality of active wireless terminal records containing corresponding downlink beamforming coefficients that have the least correlation with said new downlink beamforming coefficients and further determines from said first plurality of active wireless terminal records a first active wireless terminal record containing an active orthogonal code used for downlink transmissions to a least number of said plurality of wireless access terminals.

8. (Original) The apparatus as set forth in Claim 7 wherein said controller assigns said active orthogonal code in said first active wireless terminal record to be used in downlink transmissions to said new wireless access terminal.

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9. (Original) The apparatus as set forth in Claim 2 wherein said controller receives said new downlink beamforming coefficients from a beamforming controller that determines said new downlink beamforming coefficients from an uplink signal transmitted by said new wireless access terminal.

10. (Original) The apparatus as set forth in Claim 2 wherein said base station is operable to communicate in S sectors of a cell site associated with said base station and said new wireless access terminal is being handed off from a first sector of said cell site to a second sector of said cell site, wherein said each of said R active wireless terminal records are associated with said second sector and said controller receives said new downlink beamforming coefficients from active wireless terminal records associated with said first sector.

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11. (Original) A code division multiple access (CDMA) wireless network comprising a plurality of base stations, each of said base stations communicating with a plurality of wireless access terminals using transmit beams formed by an adaptive antenna array, wherein said each base station comprises:

an apparatus for allocating orthogonal codes used for downlink transmissions to said plurality of wireless access terminals comprising:

a database capable of storing R active wireless terminal records, each of said R active wireless terminal records containing: 1) an active orthogonal code and 2) corresponding downlink beamforming coefficients used to communicate with one of said wireless access terminals; and

a controller associated with said database capable of receiving a notification that a new wireless access terminal is accessing said each base station and, in response to said notification, comparing said each of said R active wireless terminal records to new downlink beamforming coefficients suitable for forming a downlink transmit beam for transmitting to said new wireless access terminal and, in response to said comparison, determines at least one active wireless terminal record containing corresponding downlink beamforming coefficients that have the least correlation with said new downlink beamforming coefficients.

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12. (Original) The CDMA wireless network as set forth in Claim 11 wherein said controller assigns an active orthogonal code in said at least one active wireless terminal record to be used in downlink transmissions to said new wireless access terminal.

13. (Original) The CDMA wireless network as set forth in Claim 12 wherein said base station uses up to K orthogonal codes for said downlink transmissions and said controller compares said each of said R active wireless terminal records to said new downlink beamforming coefficients in response to a determination that all of said K orthogonal codes are in use.

14. (Original) The CDMA wireless network as set forth in Claim 13 wherein said controller determines a first plurality of active wireless terminal records containing corresponding downlink beamforming coefficients that have the least correlation with said new downlink beamforming coefficients and further determines from said first plurality of active wireless terminal records a first active wireless terminal record containing an active orthogonal code used for downlink transmissions to a least number of said plurality of wireless access terminals.

15. (Original) The CDMA wireless network as set forth in Claim 14 wherein said controller assigns said active orthogonal code in said first active wireless terminal record to be used in downlink transmissions to said new wireless access terminal.

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16. (Original) The CDMA wireless network as set forth in Claim 12 wherein said base station is operable to communicate in S sectors of a cell site associated with said base station and said base station uses up to K orthogonal codes in each of said S sectors for said downlink transmissions and wherein said controller compares said each of said R active wireless terminal records to said new downlink beamforming coefficients in response to a determination that all of said K orthogonal codes are in use in a first sector in which said new wireless access terminal is accessing said base station.

17. (Original) The CDMA wireless network as set forth in Claim 16 wherein said controller determines a first plurality of active wireless terminal records containing corresponding downlink beamforming coefficients that have the least correlation with said new downlink beamforming coefficients and further determines from said first plurality of active wireless terminal records a first active wireless terminal record containing an active orthogonal code used for downlink transmissions to a least number of said plurality of wireless access terminals.

18. (Original) The CDMA wireless network as set forth in Claim 17 wherein said controller assigns said active orthogonal code in said first active wireless terminal record to be used in downlink transmissions to said new wireless access terminal.

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19. (Original) The CDMA wireless network as set forth in Claim 12 wherein said controller receives said new downlink beamforming coefficients from a beamforming controller that determines said new downlink beamforming coefficients from an uplink signal transmitted by said new wireless access terminal.

20. (Original) The CDMA wireless network as set forth in Claim 12 wherein said base station is operable to communicate in S sectors of a cell site associated with said base station and said new wireless access terminal is being handed off from a first sector of said cell site to a second sector of said cell site, wherein said each of said R active wireless terminal records are associated with said second sector and said controller receives said new downlink beamforming coefficients from active wireless terminal records associated with said first sector.

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21. (Original) For use in a base station of a code division multiple access (CDMA) wireless network, wherein the base station communicates with wireless access terminals using transmit beams formed by an adaptive antenna array, a method for allocating orthogonal codes used for downlink transmissions to wireless access terminals, the method comprising the steps of:

storing R active wireless terminal records, each of the R active wireless terminal records containing: 1) an active orthogonal code; and 2) corresponding downlink beamforming coefficients used to communicate with one of the wireless access terminals;

receiving a notification that a new wireless access terminal is accessing the base station;

in response to the notification, comparing each of the R active wireless terminal records to new downlink beamforming coefficients suitable for forming a downlink transmit beam for transmitting to the new wireless access terminal; and

in response to the comparison, determining at least one active wireless terminal record containing corresponding downlink beamforming coefficients that have the least correlation with the new downlink beamforming coefficients.

22. (Original) The method as set forth in Claim 21 further comprising the step of assigning an active orthogonal code in the at least one active wireless terminal record to be used in downlink transmissions to the new wireless access terminal.

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23. (Original) The method as set forth in Claim 22 wherein the base station uses up to K orthogonal codes for the downlink transmissions and the step of comparing comprises the step of comparing each of the R active wireless terminal records to the new downlink beamforming coefficients in response to a determination that all of the K orthogonal codes are in use.

24. (Original) The method as set forth in Claim 23 further comprising the steps of:
determining a first plurality of active wireless terminal records containing corresponding downlink beamforming coefficients that have the least correlation with the new downlink beamforming coefficients; and
determining from the first plurality of active wireless terminal records a first active wireless terminal record containing an active orthogonal code used for downlink transmissions to a least number of the wireless access terminals.